iron and cobalt.

3. A method of using reverse micelles as nano-reactors for the growth of metal colloids comprising:

growing a thin layer of magnetic material on a diamagnetic core; and coating the surface with a diamagnetic coating.

- 4. The method of claim 3, wherein cetyltrimethylammonium bromide, n-butanol, octane and aqueous reactants are used to synthesize a nanocomposite.
- 5. (amended) The method of claim 3, used to form a nanocomposite having a gold core onto which a thin layer of iron is grown, which is then passivated with gold.
- 6. Stable nanoparticles formed by the method of claim 1.
- 7. Ferrofluids made with nanoparticles of claim 6.
- 8. Granular GMR materials made with the nanoparticles of claim 6.
- 9. Inductor materials made with the nanoparticles of claim 6.
- 10. Storage media made with the nanoparticles of claim 6.
- 11. Giant magnetoresistance sensors made with the nanoparticles of claim 6.19. (amonded) Formelistics made
- 12. Directed drug delivery agents made with the nanoparticles of claim 6.
- 13. Agents for targeted sensing for in vivo applications made with the nanoparticles of claim 6.4600 and 13.
- 14. A nanocomposite comprising:
- a diamagnetic core;
- a thin layer of magnetic material formed on the diamagnetic core;
- a passivating layer of diamagnetic material formed on the layer of magnetic material.
- 15. The nanocomposite of claim 14, wherein:



the diamagnetic core is a material from the group consisting of gold, silver, copper, and platinum;

the magnetic material is a material from the group consisting of iron and cobalt and alloys containing iron and/or cobalt;

the passivating layer is a material from the group consisting of gold, silver, platinum, and copper, and alloys containing these materials.

- 16. (amended) The nanocomposite of claim 14, comprising:
- a gold core;
- a thin layer of iron formed on the gold core;
- a passivating layer of gold on the layer of iron.
- 17. (amended) The nanocomposite of claim 14, produced with a reverse micelle synthesis technique.
- 18. (amended) The nanocomposite of claim 14, synthesized using cetyltrimethylammonium bromide, n-butanol, octane and aqueous reactants.
- 19. (amended) Ferrofluids made with the nanocomposite of claim 14.
- 20. (amended) Granular GMR materials made with the nanocomposite of claim 14.
- 21. (amended) Inductor materials made with the nanocomposite of claim 14.
- 22. (amended) Storage media made with the nanocomposite of claim 14.
- 23. (amended) Giant magnetoresistance sensors made with the nanocomposite of claim 14.
- 24. (amended) Directed drug delivery agents made with the nanocomposite of claim 14.
- 25. (amended) Agents for targeted sensing for *in vivo* applications made with the nanocomposite of claim 14.